

# METHOD OF MAKING AN OPHTHALMIC LENS OF PROGRESSIVELY VARIABLE FOCAL POWER

## BACKGROUND OF THE INVENTION

### 1. Field of the Invention

The present invention relates, in general terms, to the production of ophthalmic lenses of progressively variable focal power, that is to say ophthalmic lenses of the type in which at least one of the faces has a zone of progressively variable curvature on at least one side of at least one central line, referred to below as active zone for the sake of simplicity of expression; more particularly, the invention is concerned with those of this type of ophthalmic lens which are made from organic materials.

### 2. Description of the Prior Art

As is known, organic materials used for ophthalmic lenses readily lend themselves to a process whereby the desired profile of the lenses, which it is desired to obtain, can be directly arrived at by casting between two casting dies which have been suitably machined and buffed, in contradistinction to mineral glass which, after casting, usually required a three-stage operation of rough grinding, buffing and honing.

With respect to the casting from organic material of ophthalmic lenses having progressively variable focal power, it is usual to proceed through the intermediary of a semi-finished circular blank, one of whose faces, which is more usually the convex face, is given through casting the desired active zone with a progressively variable radius of curvature. The other face of the blank is cast with an initial, generally spherical, shape and has to be given a second machining operation such as to give it the configuration (for example cylindrical, toroidal or some other shape), which is suitable for other defects of vision from which the different patients in question may suffer, by a similar variation of focal power.

Indeed, it is more economic — taking into account firstly, the difficulties of obtaining an active zone of progressively variable focal power and, secondly, the diversity, qualitatively and quantitatively, of the different possible corrections of vision — to produce a reduced number of semi-finished lens blanks covering, by their finished face, the possible range of progressively variable focal power and then to adapt these blanks by machining their other face, to the different instances of practical usage which prove to be necessary.

For the second machining operation carried out on one of the faces of these semi-finished blanks, it is usual to mount a gripper block on the other face, by cooling a low melting point material between the said face and a bell-shaped mould which is open towards this face, the gripper block being such as to enable the blank to be suitably held and then positioned on a machine tool.

After the face in question (that is to say the face lying opposite that bearing the gripper block) has been machined to the desired profile, the gripper block is removed by melting it.

However, with regard to the production of lenses of progressively variable focal power, the bell-shaped mould suitable for casting a gripper block on the semi-finished circular blanks in question should, for reasons stated above, be applied to the finished face of these blanks comprising the active zone of progressively variable radius of curvature.

The result of this is — taking into account, firstly, the variations of curvature at the periphery of the face in question of these blanks, these variations differing from one blank to another, and, secondly, taking into account the shape (usually that of a body of revolution) of the bell-shaped mould which is used without distinction for casting a gripper block on the finished face of any of these blanks — that, when the free edge of this mould is applied to the surface of a blank, the seal provided by the two mating surfaces is not a sufficiently intimate one, at all points on the surface of the blank, to prevent at least local leakage of the low melting point material, which normally has to be confined when the blank is being cast.

In order to remedy this drawback it has already been proposed, more specifically for making ophthalmic lenses of mineral glass, to interpose, between the bell-shaped mould and the face of the semi-finished blank, a fitting ring having a free edge which is complementary to the edge of this mould, at a free edge which is complementary to the face concerned of the blank. A fitting ring of this kind is delivered, together with the blank, to the operative who is to machine the blank.

In addition to the fact that this provision, although it is very suitable in the case of ophthalmic lenses of mineral glass, requires the manufacture and supply, for each semi-finished lens blank of a fitting ring adapted to the progressive face of the blank, this provision does not share, in the case of ophthalmic lenses of organic material, the casting facilities available to these ophthalmic lenses.

A first object of this invention is the provision of a method which, by way of contrast, enables the use of a fitting ring of this kind to be dispensed with when a gripper block is being cast on the progressively variable face of a semi-finished lens blank, the other face of which is to be machined.

## SUMMARY

In the method according to the invention for producing an ophthalmic lens of progressively variable focal power, particularly from organic material, there is obtained, by casting a material of this kind between two casting dies, a semi-finished lens blank having at least one face with an active zone having a progressively variable radius of curvature, on at least one side of at least one central line. A gripper block is applied, on the face in question of the said blank, by casting a low melting point material between the said face and a bell-shaped mould open towards this face, which gripper block enables the blank to be securely held whilst the face of this blank lying opposite the face bearing the gripper block is machined to the desired profile, and the gripper block is subsequently removed by melting. The method is characterized in that, when the blank is being cast, there is formed, at the periphery of the active zone of the said one face of the disc, an edge facet which extends, continuously and circularly, the whole way round the active zone, and which is thus suitable for forming a supporting face on which the bell-shaped mould can be directly applied by its free edge, in a tight-sealing manner.

Thus, there is no need, with concomitant advantage, to interpose any fitting ring between the bell-shaped mould used and the face of the blank to which the said mould is applied.

Furthermore, the edge facet provided for this purpose according to the invention is directly formed at the